Emerging Information Technologies: DEVELOPING A TIMELY IT STRATEGY

A model for quickly sifting through emerging technologies to find the best organizational fit.

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echnology executives tend not to consider the integration of emerging information technologies (EITs)innovations with incomplete standardization or limited commercial accessibility (such as beta versions of software or prototypes of hardware)-when planning an IT strategy. A survey of 212 CIOs from Fortune 1000 firms revealed that only 31% of the respondents evaluated an EIT during a recent IT strategic planning session [3]. Of the responding CIOs who had not explored the possibilities of EITs in their IT strategic planning phase, 68% indicated they lacked sufficient time during strategy planning to explore and acquire knowledge regarding EITs as potential components of their respective IT strategy [3]. This is unfortunate, since more than half of those CIOs who did not consider EITs in their recent strategic planning sessions stated that such consideration might have contributed to the development of a more timely IT strategy [3].

Given these survey results, we offer several insights and an evaluation model that CIOs can utilize to organize an expedient investigation of an emerging technology's potential fit into organizational IT strategy.

The surveyed executives indicated unanimously that access to information regarding EITs and the time resources required to evaluate the new technologies are critical preliminary evaluation factors [1, 3]. In order to expedite the data collection process and subsequent evaluation process, the study participants offered the following recommendations:

- Review new technologies on a continuous basis. Each week allocate time to investigating what's new.
- Create lasting resource files. A new technology may not provide potential value to your organization today, but tomorrow may be a different story.
- Define your existing business processes and

supporting IT for each process. One executive says "drawing a diagram [of your systems] works because it creates a 'drag and drop' overview of your entire infrastructure. From that drawing I know what might work for each process."

- Create a collection of trade journals and online publications for quick references. "I can find most of my preliminary information at two sites: CIO.com and ZDNet.com," says the CIO of a public utility in the southeastern U.S.
- Listen to your people in the trenches. Your organization's frontline programmers, analysts, and other techies are

valuable sources of insight into emerging technologies.

- Collect data in a preliminary fashion, not as if to prepare a final analysis. Get an overview of the new technology. After a cursory review suggests the new technology applicable for your organization, do additional research.
- Ask questions. When collecting data on a new technology, correspondence with the product's developers is often the most expeditious means of getting the facts.

BEGIN AT THE BEGINNING

o ground

our evaluation model, we conducted a fourround Web-based Delphi study. Seventy-five senior IT executives, who classified their organization's IT

strategy as "innovative" based on their previous use of EITs, participated in the study. Initially, each executive read three separate vignettes describing a different technology (Bluetooth, XML, and Virtual Retinal Display) that qualified, per the definition described herein, as an EIT. Next, each executive contributed, via the study Web pages, his or her thoughts regarding the potential integration of the sample EIT into corporate strategy. Finally, the exec-



utives reviewed all 169 of the unique comments and formulated a set of 23 unique issues they perceived as important with respect to

Figure 1. Examples of business and technical alignment issues (adapted from online chat sessions with participating CIOs).

integrating EITs into corporate strategy. In subsequent rounds, the group ranked and re-ranked the

issues to produce a consensus of the most important issues to consider when contemplating the integration of EITs into IT strategy (see Table 1).

Qualitative feedback collected via a series of online chat sessions with the study participants revealed that the overwhelming majority of the participating executives believe the integration

Issue Rank Ability to gain competitive advantage through the use of the EIT I Ability to sustain competitive advantage provided by the EIT 2 Security aspects involved with using the EIT 3 Appropriateness of EIT for use by customers/clients 4 Reliability of the technology 5 Compatibility of EIT with existing information systems 6 Supports current business operations/processes 7 8 Capable of supporting future business process/operations Standardization of technical specifications of the EIT 9 Italicized issues relate to Business Alignment Non-italicized issues relate to Technical Alignment

production division?

Table 1. Consensus ranking of

decision of EITs is stratified into two separate but interrelated assessment areas: business alignment issues and technical alignment issues. Interestingly, alignment, in numerous facets, was noted as a key issue in IT strategy in several previous research studies [2]. According to a global IT firm CIO, whose sentiments were widely supported by the group, the two areas differ in that "business issues address the general ways and means that a particular technology will support an organization's objectives," while

top issues from final Delphi round (1 = most important).

Most of the participants expressed competitive advantage not in terms of a single application of technology that produces a benefit for a finite amount of time, but rather as a continuous effort to manage the integration of technologies as they develop.

Technical

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Gain/Sustain Competitive Advantage

To continuously identify and integrate emerging technologies that contribute to a more effective/efficient firm

Appropriateness of Technology for Use by External Entities

> To consider technology preferences of customer/clients/supplies when evaluating emerging technologies

Compatibility of Technology with Current/ Future Business Operations

To establish a "fit" between the core competencies of the business and emerging technologies



objectives. A CIO from an international petrochemical conglomerate summarized the group sentiment as follows:

"It is easy to become fascinated by cutting-edge technologies, but we all know the bottom line. If it [an emerging information technology] won't make us better at what we do, than it has no place in our organization."

From the initial listing of 23 unique issues and the subsequent executive classifications solicited during the online chat sessions,

Figure 2. Definitions of EIT business alignment and technical alignment issues. technical alignment issues focus on "the nuts and bolts of a particular technology like compatibility with existing systems." Generally, the business alignment issues

reflect concerns that are universal to all organizations: competitive advantage, customer relationship management, and organizational fit. Conversely, the technical alignment issues are firm specific, as the study group described. The group provided specific examples of both business alignment and technical alignment issues during an online chat session (see Figure 1). From the context of the online chat, concise definitions of the alignment categories were developed (see Figure 2).

The consensus ranking of the top issues presented in Table 1 illustrates a clear distinction between business and technical alignment. Particularly, Issues 1, 2, 4, 7, and 8 represent business alignment issues while Issues 3, 5, 6, and 9 pertain to technical alignment issues. While the group saw both areas as "equally important," a consensus formed among the executives that the integration decision regarding EITs must focus initially on business alignment issues in order to ensure support for organizational we developed the EIT evaluation model presented in Figure 3.

BUSINESS ALIGNMENT ISSUES

practitioners and any researchers have long held the popular opinion that competitive advantages derived from using IT are often short-lived because of the ability of competitors to replicate, and subsequently eliminate, the advantage [4, 5]. The participating CIOs unanimously agreed that gaining and subsequently sustaining a competitive advantage via the integration of an EIT into strategy are paramount concerns in the EIT evaluation process. Interestingly, most of the participants expressed competitive advantage not in terms of a single application of technology that produces a benefit for a finite amount of time, but rather as a continuous effort to manage the integration of technologies as they develop. Given this information, we have modularized competitive advantage into the single components shown in the model.

According to the executive respondents, the sec-

ond business alignment issue to consider when evaluating an EIT is the appropriateness of the technology for the organization's customers or clients. The former CIO of an international women's fashion retailer explained his perception of appropriateness of technology with the following example:

"We evaluated an ecommerce plan prior to 1996. It was a comprehensive plan we had on the table and it would have been costly. We learned from prelimi-

nary market studies that our customers would not purchase our clothes online. For them, there is a need to see and feel a garment before they buy. They like to come into the store and try it on, see it in the mirror, and get some opinions on how it makes them look. Because of that, we decided not to incorporate an e-commerce platform in our Web presence. I'll also tell you that watching all of our competition move to e-commerce platforms made us all worry. We wondered if we had made the right decision. Five years after, we know our assessment of our customers was right on. I know that our competitors haven't experienced the kind of return on their sites that they expected. We know it all boils down to our customers' preferences."

Within the domain of business alignment, the respondents defined business operations compatibility as the final qualitative issue to consider when evaluating an EIT. One CIO suggested that by appropriately evaluating the compatibilities of an



Figure 3. EIT evaluation model.

EIT with current and future organizational operations, an IT strategist can avoid the difficult lesson learned by so many adopters of ERP systems in the late 1990s: integrating technology for the sake of technology is a poor approach to developing an IT strategy. The overriding theme expressed by the group regarding EITs and operations compatibility is the paramount importance of ensuring that organizational operations are not altered solely to allow for technology integration. While all agreed that it is completely acceptable to

utilize technology to facilitate organizational change, attempts to conform organizational processes around an EIT are tantamount to placing the cart in front of the horse [6].

TECHNICAL ALIGNMENT ISSUES

ccording to the study group, once an IT strategist has completely assessed the business alignment issues regarding an EIT, it is appropriate to explore the relevant technical issues of the emerging technology. Initially, the technical analysis should focus on the current and future uses of the EIT within the organization. The CIO of an international paper products manufacturer explained the analysis of potential uses of an EIT as a "proactive"

Most of the executives indicated that the key to future use of an emerging technology is the analysis of the wealth of information available from technology developers. activity. Several of the group participants suggested that identifying future uses of an EIT is very difficult because of the nature of technology evolution. The CTO of an international logistics firm summarized the problem as follows:

"One problem with anticipating future uses of technologies is that developments can take place like an explosion, but it usually takes time for support to catch up. Look at ISDN. The technology was developed long before the rules were ever worked out. By the time everybody finally agreed on the standards, ISDN was an afterthought for broadband."

Although the identification of future uses of an EIT requires some forecasting, most of the executives in the study indicated that the key to future use assessment of an emerging technology is the analysis of the wealth of information available from technology developers.

The final two assessment areas in the EIT evaluation model are components of technical alignment: performance issues and systems compatibility issues. Performance issues collectively reflect the myriad of technology specifications of an EIT. For example, many of the participating executives were particularly concerned about the technical security factors associated with new technologies. Given the events of Sept. 11, 2001, the concern for security is understandable. However, performance issues also include other technical areas such as product reliability, particularly with respect to hardware and end-user training for new software. Systems compatibility issues, on the other hand, center on the specifics of integrating an EIT into an organization's existing IT infrastructure. Most of the systems compatibility issues focused on specific areas such as cross-platform connectivity, software application integration, deployment, and product support.

CONCLUSION

iven the rate of technological evolution, the exclusive use of currently available commercial technologies often creates a rapidly outdated IT strategy. It may be useful for technology executives to apply the model presented herein to remedy this problem. In doing so, a CIO should first focus on the business alignment issues and conduct exploratory research to identify whether an EIT can be leveraged into a competitive advantage through enhanced operating efficiency, greater access to markets, or otherwise. Typically, this task requires the CIO to visualize his or her organization as it competes with its rivals in the global marketplace. Next, and assuming some competitive advantage may be obtained via integrating an EIT, a CIO must determine whether the technology is appropriate for his or her user base. One can accomplish this through a formal or informal survey. Finally, the CIO considering the EIT must subjectively decide if the new technology will fit within the current as well as long-range operational plan of the firm. Often, this step requires the CIO to discuss operational objectives with other executive directors as well as operations level managers. After the business alignment issues have been addressed, the CIO, with the help of IT staff, may assume the responsibility of conducting a technical fit analysis for the EIT.

Using the model presented herein, IT executives can work toward the creation of a more timely IT strategy by quickly assessing the potential fit of emerging information technologies within a firmspecific context. As a result, forward-looking IT strategies that capitalize on early innovation are developed. The net effect is a longer useful life for an IT strategy.

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